

WHAT IS CLAIMED IS:

1. A method of generating an interpolated image, comprising:

inputting a video signal including a first  
5 reference image, a second reference image and a third reference image that continue in terms of time

generating a first interpolation image put in a position of the second reference image, using the first reference image and the third reference image;

10 computing a correlation value between the second reference image and the first interpolation image;

generating a second interpolation image put in an interpolation position between the second reference image and the third reference image; and

15 interposing the second interpolation image in the interpolation position when the correlation value is not less than a threshold.

2. The method according to claim 1, wherein the computing computes the correlation value based on at  
20 least one of a differential value between images of a luminance component, a differential value between images of a color difference component, a differential value between images of a luminance component and a color difference component, a multiplication value  
25 between images of a luminance component, a division value between images of a luminance component, a multiplication value between images of a color

difference component, a division value between images  
of a color difference component, a multiplication value  
between images of a luminance component and a color  
difference component, and a division value of a  
5 luminance component and a color difference component.

3. The method according to claim 1, wherein  
generating the first interpolation image includes  
generating the first interpolation image by at least  
one of (a) a manner of generating the first inter-  
10 polation image by means of a motion vector between the  
first reference image and the third reference image,  
(b) a manner of generating the first interpolation  
image by obtaining an average of the first reference  
image and the third reference images according to  
15 distances of the first reference image and the third  
reference image with respect to the second reference  
image, and (c) a manner of determining the first  
reference image to the first interpolation image.

4. The method according to claim 1, wherein  
20 generating the second interpolation image includes  
generating the second interpolation image using a  
motion vector between the second reference image and  
the third reference image.

5. The method according to claim 1, wherein  
25 generating the second interpolation image includes  
generating the second interpolation image by  
calculating an average of the second reference image

and the third reference image according to distances of the second reference image and the third reference image with respect to the interpolation position.

5       6. The method according to claim 1, wherein the computing includes computing the correlation value in units of a plurality of blocks obtained by dividing each of two images used for correlation computation.

10       7. The method according to claim 1, wherein the interposing includes interposing the second interpolation image in units of a plurality of blocks obtained by dividing an image to be interpolated.

8. A method of generating an interpolation image, comprising:

15       inputting a video signal including a first reference image, a second reference image and a third reference image that continue in terms of time;

20       generating a plurality of first interpolation images by different interpolation image generation manners, respectively, using the first reference image and the third reference image, the first interpolation images corresponding to a position of the second reference image;

25       computing a correlation value between the second reference image and each of the first interpolation images;

      selecting one of the interpolation image generation manners that the correlation value becomes

maximum;

generating a second interpolation image put in an interpolation position between the second reference image and the third reference image according to a  
5 selected one of the interpolation image generation manners; and

interposing the second interpolation image in the interpolation position.

9. The method according to claim 8, wherein the  
10 computing computes the correlation value based on at least one of a differential value between images of a luminance component, a differential value between images of a color difference component, a differential value between images of a luminance component and a  
15 color difference component, a multiplication value between images of a luminance component, a division value between images of a luminance component, a multiplication value between images of a color difference component, a division value between images  
20 of a color difference component, a multiplication value between images of a luminance component and a color difference component, and a division value of a luminance component and a color difference component.

10. The method according to claim 8, wherein  
25 generating the first interpolation image includes generating the first interpolation image by at least one of (a) a manner of generating the first

interpolation image by means of a motion vector between the first reference image and the third reference image, (b) a manner of generating the first interpolation image by obtaining an average of the first  
5 reference image and the third reference images according to distances of the first reference image and the third reference image with respect to the second reference image, and (c) a manner of determining the first reference image to the first interpolation image.

10 11. The method according to claim 8, wherein generating the second interpolation image includes generating the second interpolation image using a motion vector between the second reference image and the third reference image.

15 12. The method according to claim 8, wherein generating the second interpolation image includes generating the second interpolation image by calculating an average of the second reference image and the third reference image according to distances of  
20 the second reference image and the third reference image with respect to the interpolation position.

13. The method according to claim 8, which includes comparing the minimum of the correlation value with a threshold, and interposing the second reference  
25 image in the interpolation position when the minimum is not less than the threshold.

14. The method according to claim 8, wherein the

computing includes computing the correlation value in units of a plurality of blocks obtained by dividing each of two images used for correlation computation.

15        15. The method according to claim 8, wherein the interposing includes interposing the second interpolation image in units of a plurality of blocks obtained by dividing an image to be interpolated.

16. A method of generating an interpolation image, comprising:

10        inputting a video signal including a first reference image, a second reference image and a third reference image that continue in terms of time;

         generating a first interpolation image put in a position between the second reference image and the third reference image, using the second reference image and the third reference image;

         generating, using the first interpolation image and a second interpolation image already interposed between the first reference image and the second reference image, a third interpolation image put in a position of the second reference image;

         computing a correlation value between the second reference image and the third interpolation image; and

25        interposing the first interpolation image in the interpolation position when the correlation value is not less than a threshold.

17. The method according to claim 16, wherein the

computing computes the correlation value based on at least one of a differential value between images of a luminance component, a differential value between images of a color difference component, a differential value between images of a luminance component and a color difference component, a multiplication value between images of a luminance component, a division value between images of a luminance component, a multiplication value between images of a color difference component, a division value between images of a color difference component, a multiplication value between images of a luminance component and a color difference component, and a division value of a luminance component and a color difference component.

18. A method of generating an interpolation image, comprising:

inputting a video signal including a first reference image, a second reference image and a third reference image that continue in terms of time;

generating a plurality of first interpolation images by different interpolation image generation manners, respectively, the first interpolation images put in an interpolation position between the second reference image and the third reference image;

generating, using the first interpolation image and a second interpolation image, a plurality of third interpolation images by the interpolation image

generation manners, respectively, the second interpolation image already interposed between the first reference image and the second reference image, and the third interpolation images put in a position of the second reference image;

computing a correlation value between the second reference image and each of the third interpolation images

selecting one of the interpolation image generation manners that the correlation value becomes maximum; and

interposing, in the interpolation position, one of the first interpolation images that is generated according to a selected one of the interpolation image generation manners.

19. The method according to claim 18, wherein the computing computes the correlation value based on at least one of a differential value between images of a luminance component, a differential value between images of a color difference component, a differential value between images of a luminance component and a color difference component, a multiplication value between images of a luminance component, a division value between images of a luminance component, a multiplication value between images of a color difference component, a division value between images of a color difference component, a multiplication value



between images of a luminance component and a color difference component, and a division value of a luminance component and a color difference component.

20. An interpolation image generating apparatus  
5 comprising:

a video input unit configured to input a video signal including a first reference image, a second reference image and a third reference image that continue in terms of time;

10 a first generator to generate a first interpolation image put in a position of the second reference image, using the first reference image and the third reference image;

a computation unit configured to compute a  
15 correlation value between the second reference image and the first interpolation image;

a second generator to generate a second interpolation image put in an interpolation position between the second reference image and the third  
20 reference image; and

an interpolation unit configured to interpolate the second interpolation image in the interpolation position when the correlation value is not less than a threshold to generate an interpolated video signal.

25 21. An interpolation image generating apparatus comprising:

a video input unit configured to input a video

signal including a first reference image, a second reference image and a third reference image that continue in terms of time;

5 a first generator to generate a plurality of first interpolation images by different interpolation image generation manners, respectively, using the first reference image and the third reference image, the first interpolation images corresponding to a position of the second reference image;

10 a computation unit configured to compute a correlation value between the second reference image and each of the first interpolation images;

15 a selector to select one of the interpolation image generation manners that the correlation value becomes maximum;

20 a second generator to generate a second interpolation image put in an interpolation position between the second reference image and the third reference image according to a selected one of the interpolation image generation manners; and

an interpolation unit configured to interpolate the second interpolation image in the interpolation position.

25 22. An interpolation image generating apparatus comprising:

a video input unit configured to input a video signal including a first reference image, a second

reference image and a third reference image that  
continue in terms of time;

5 a first generator to generate a first inter-  
polation image put in a position between the second  
reference image and the third reference image, using  
the second reference image and the third reference  
image;

10 a second generator to generate, using the first  
interpolation image and a second interpolation image  
already interposed between the first reference image  
and the second reference image, a third interpolation  
image put in a position of the second reference image;

15 a computation unit configured to compute a  
correlation value between the second reference image  
and the third interpolation image; and

an interpolation unit configured to interpolate  
the first interpolation image in the interpolation  
position when the correlation value is not less than a  
threshold.

20 23. An interpolation image generating apparatus  
comprising:

a video input unit configured to input a video  
signal including a first reference image, a second  
reference image and a third reference image that  
25 continue in terms of time;

a first generator to generate a plurality of first  
interpolation images by different interpolation image

generation manners, respectively, the first interpolation images put in an interpolation position between the second reference image and the third reference image;

5           a second generator to generate, using the first interpolation image and a second interpolation image, a plurality of third interpolation images by the interpolation image generation manners, respectively, the second interpolation image already interposed  
10       between the first reference image and the second reference image, and the third interpolation images put in a position of the second reference image;

          a computation unit configured to compute a correlation value between the second reference image  
15       and each of the third interpolation images;

          a selector to select one of the interpolation image generation manners that the correlation value becomes maximum; and

          an interpolation unit configured to interpolate,  
20       in the interpolation position, one of the first interpolation images that is generated according to a selected one of the interpolation image generation manners.

24. A video display system comprising the  
25       interpolation image generating apparatus according to claim 20 and a display device configured to display the interpolated video signal generated by the

interpolation image generating apparatus.

25. A method of generating an interpolated image, comprising:

inputting a video signal including a first  
5 reference image, a second reference image and a third reference image that continue in terms of time;

generating a first interpolation image put in a position of the second reference image, using the first reference image and the third reference image;

10 computing a correlation value between the second reference image and the first interpolation image;

generating a second interpolation image put in an interpolation position between the second reference image and the third reference image when the  
15 correlation value is not less than a threshold.

26. The method according to claim 25, wherein the computing computes the correlation value based on at least one of a differential value between images of a luminance component, a differential value between  
20 images of a color difference component, a differential value between images of a luminance component and a color difference component, a multiplication value between images of a luminance component, a division value between images of a luminance component, a  
25 multiplication value between images of a color difference component, a division value between images of a color difference component, a multiplication value

between images of a luminance component and a color difference component, and a division value of a luminance component and a color difference component.

27. The method according to claim 25, wherein  
5 generating the first interpolation image includes  
generating the first interpolation image by at least  
one of (a) a manner of generating the first inter-  
polation image by means of a motion vector between the  
first reference image and the third reference image,  
10 (b) a manner of generating the first interpolation  
image by obtaining an average of the first reference  
image and the third reference images according to  
distances of the first reference image and the third  
reference image with respect to the second reference  
15 image, and (c) a manner of determining the first  
reference image to the first interpolation image.

28. The method according to claim 25, wherein  
generating the second interpolation image includes  
generating the second interpolation image using a  
20 motion vector between the second reference image and  
the third reference image.

29. The method according to claim 25, wherein  
generating the second interpolation image includes  
generating the second interpolation image by  
25 calculating an average of the second reference image  
and the third reference image according to distances of  
the second reference image and the third reference

image with respect to the interpolation position.

30. The method according to claim 25, wherein the  
computing includes computing the correlation value in  
units of a plurality of blocks obtained by dividing  
5 each of two images used for correlation computation.